IN THE DRAWINGS

Please add FIG. 13, labeled as REPLACEMENT SHEET and attached hereto as Exhibit A, to the drawings.

REMARKS

Claims 1-6, 8-9, 11, 13, 14, 17-24, 27, 28, 31, 33, 34, 36-49, and 63-74 were pending in the present application. The Office Action cancelled claims 20-50, 63, 65, and 66 from the application. Applicants have amended claims 1, 8, 67, and 71, and have added new claims 75-98, similar to claims 20-50 and 66. Reexamination and reconsideration of all of the claims, as amended, are respectfully requested.

Further Restriction/Specification Objection

Applicants take issue with the further restriction of the claims presented, specifically the identification of an alleged new species. Further restriction at this time is impermissible. As noted in M.P.E.P. 809.02(c), any action subsequent to an election of species should include a complete action on the merits of all claims readable on the elected species. Applicants submit that this "complete action on the merits" does not contemplate a further restriction based on a subsequent recitation of additional species, as has occurred here.

Nonetheless, Applicants have added claim 75 and claims dependent therefrom to recite the 0.10 mm field size aspect of the design and contend that this limitation places the claim and all claims dependent therefrom within the provisionally elected species. Applicants have also amended the description of FIG. 7 to include this 0.10 mm field size aspect, called out at page 31, ll. 8-15 of the specification:

> The use of two field lens elements allows the immersion objective of the design of FIG. 7 to be corrected over a significantly wider bandwidth range, namely for bandwidths from approximately *266 to 800 nm*. The objective of FIG. 7 provides a field size of approximately *0.100 mm* and maintains the high approximately 1.1 numerical aperture assuming pure water is used as an immersion liquid.

(emphasis added).

Drawings

The Office Action objected to the drawings based on an alleged lack of a microscope and associated elements in the drawings. Applicants respectfully respond by stating that disclosure in the specification is sufficient for one of ordinary skill to make and use the invention, and submits that not all concepts must be disclosed in the drawings, and the statement formerly at page 13 of the specification sufficiently details the relationship between the microscope, flange, and objective and the spacing between flange and specimen. Further detail in the form of a drawing is believed not required such that the specification may be understood by one skilled in the art.

Nonetheless, in an effort to provide support in the drawings and facilitate full allowance of the present application, Applicants have visually supplemented the statement at page 13 with newly added FIG. 13, labeled as a replacement sheet. Applicants submit that addition of the conceptual drawing of FIG. 13 including a microscope and a flange is not an addition of new matter, as sufficient support existed in the specification for the microscope, flange, and other elements shown in FIG. 13.

Applicants therefore respectfully submit that the application and drawings fully conform with 37 CFR §§ 1.83 and 1.121, and that no new matter has been added to the application.

35 U.S.C. §112

The Office Action rejected claims 2, 13, 14 and 68 under 35 U.S.C. §112 based on use of the phrases "corrected bandwidth" and "relative bandwidth."

Applicants have amended claims 13 and 14 to employ the term "bandwidth," a term commonly understood in the art.

Regarding the term "relative bandwidth," the term is known to those skilled in the inspection arts. As is generally understood to those skilled in the optical design art, particularly in the field of semiconductor inspection tools, the term "relative bandwidth" represents the bandwidth, sometimes called absolute bandwidth, divided by the central wavelength. Thus

Applicants contend that claims 2 and 68 are clear and definite, and all claims as amended conform to 35 U.S.C. §112.

Double Patenting

The Office Action provisionally rejected claims 1, 5-6, 8, 17-18, 67, and 71-73 based on claims 43 and 45-48 of co-pending application 10/646,073. The Office Action further provisionally rejected claims 1, 3, 8, 9, 17-19, 67, 69, and 73-74 based on claims 1-2, 4, 7-9 and 11 of co-pending application 10/434,374 in view of U.S. Patent 4,108,794 to Yonekubo ("Yonekubo") or U.S. Patent 5,825,043 to Suwa ("Suwa").

Applicants understand and are willing to submit a terminal disclaimer to overcome the rejection based on the 10/646,073 application. Applicants dispute the double patenting rejection based on the 10/434,374 in combination with Yonekubo and Suwa.

Applicants note that they have amended the independent claims of the present application. In the interest of Applicants' desire to submit one terminal disclaimer and incur a single terminal disclaimer fee in this case, Applicants are not willing to submit a terminal disclaimer at this time, but would be willing to do so for the 10/646,073 application once the 10/434,374 issue is resolved.

Regarding the '374 claims in combination with Yonekubo or Suwa, Applicants contend that the inventions defined in the present claims, as amended, would not have been obvious in view of the claims presented in the '374 application in combination with the Yonekubo and Suwa references. First, the '374 claims cited do not include recitation of an immersion liquid. Second, there is no motivation to combine the '374 claims with Yonekubo or Suwa. While Applicants acknowledge that immersion liquids have been known, neither the '374 application, on the one hand, nor the Yonekubo or Suwa references, on the other, disclose or imply the specific limitations claimed by Applicants in the amended claims, including:

a focusing lens group comprising at least one focusing lens configured to receive said light energy and form focused light energy;

a plurality of field lenses oriented to receive focused light energy from said focusing lens group and provide intermediate light energy;

a Mangin mirror arrangement positioned to receive the intermediate light energy from the plurality of field lenses through a back side of the Mangin mirror arrangement and form controlled light energy transmitted from a front side of the Mangin mirror arrangement; and

an immersion liquid between the Mangin mirror arrangement and the specimen;

wherein said objective is configured to be usable with light energy having a wavelength in the range of approximately 190 to 1000 nanometers.

None of the cited references show an objective "configured to be usable with light energy having a wavelength in the range of approximately 190 to 1000 nanometers." The '374 application neither discloses nor suggests "an immersion liquid between the Mangin mirror arrangement and the specimen." And neither Yonekubo nor Suwa disclose "a focusing lens group comprising at least one focusing lens configured to receive said light energy and form focused light energy; a plurality of field lenses oriented to receive focused light energy from said focusing lens group and provide intermediate light energy; [nor] a Mangin mirror arrangement positioned to receive the intermediate light energy from the plurality of field lenses through a back side of the Mangin mirror arrangement and form controlled light energy transmitted from a front side of the Mangin mirror arrangement ..."

It is as if an immersion liquid was found in these references and assumed to be insertable into the '374 dry-inspection device. However, one could not simply place an immersion liquid within the '374 design and obtain an objective design having the beneficial aspects presently claimed or operating with any level of adequate performance. In other words, the resultant device would be a poor image and inadequate inspection in the environment claimed. Thus it is difficult, if not impossible, to argue that one would be motivated to combine the design of the '374 device with the immersion liquids of Yonekubo or Suwa based on the disclosure of the references themselves.

Thus Applicants submit that based on the totality of the limitations presented in the amended claims, the present claims do not represent double patenting based on claims 1-2, 4, 7-9 and 11 of the '374 application, in view of Yonekubo or Suwa.

35 U.S.C. §103

Shafer 722

The Office Action rejected claims 1, 2, 5, 6, 8, 9, 11, 13, 14, 17-19, 64, 67, 68, 71-73 and 74 under 35 U.S.C. §103 based on U.S. Patent Application 2001/0040722 to Shafer et al. ("Shafer 722") in view of Yonekubo or Suwa.

Applicants dispute the contention that the present design is obvious in view of Shafer 722 in combination with Yonekubo or Suwa. Shafer 722 is a broad band DUV/VUV imaging system that does not employ an immersion liquid, does not discuss an immersion liquid, and does not illustrate an embodiment having a mangin mirror arrangement wherein light energy enters through a back or rear side and is provided to a specimen, but rather uses a mangin mirror arrangement to provide substantially what may be termed a retro beam reflecting light energy back from the light energy received (see, e.g., FIG. 3). As noted, a critical issue is the complete absence of an immersion liquid.

Neither Yonekubo nor Suwa disclose nor suggest the unique properties associated with the present design, including but not limited to a focusing lens group comprising at least one focusing lens configured to receive said light energy and form focused light energy; a plurality of field lenses oriented to receive focused light energy from said focusing lens group and provide intermediate light energy; a Mangin mirror arrangement positioned to receive the intermediate light energy from the plurality of field lenses through a back side of the Mangin mirror arrangement and form controlled light energy transmitted from a front side of the Mangin mirror arrangement; wherein said objective is configured to be usable with light energy having a wavelength in the range of approximately 190 to 1000 nanometers. Yonekubo and Suwa show immersion liquids used in microscopes, but do not indicate use with light energy having a wavelength in the range of approximately 190 to 1000 nanometers, use focusing lenses and field

lenses as claimed, or disclose or suggest at least one Mangin mirror arrangement receiving light energy through a back side thereof. Again, it is as if an immersion liquid was found in these references and assumed to be insertable into the Shafer device. Alternately, it is as if the fact that objectives existed and immersion liquids existed is sufficient to reject any claims directed to a specific, inventive objective design that employs an immersion liquid. In reality, one could not simply place an immersion liquid within the Shafer 722 design and obtain an objective design having the beneficial aspects presently claimed or operating with any level of adequate performance. In other words, the resultant device would be a poor image and inadequate inspection in the environment claimed. Thus it is difficult, if not impossible, to argue that one would be motivated to combine the design of Shafer 722 with the immersion liquids of Yonekubo or Suwa based on the disclosure of the references themselves.

In sum, Shafer 722 neither discloses nor suggests use of an immersion liquid whatsoever. This motivation is provided solely by the Office Action, having viewed Applicants' claims and reconstructing the claimed invention using the claims as a guide, essentially plugging in an immersion liquid into Shafer 722, if such a combination could result in anything useful.

There is simply no suggestion in Shafer 722 to employ an immersion liquid or substance or a mangin mirror arrangement where light energy passes through a back side thereof, and no motivation in Yonekubo or Suwa to use an immersion liquid or substance in a complex lensing design comprising, for example, field lenses, focusing lenses, and a mangin mirror arrangement as currently claimed. Simply put, these references are materially diverse and each reference does not suggest employing the features disclosed in any of the other references in any manner whatsoever.

The standard for making an obviousness rejection is set forth in MPEP 706.02(j):

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make

> the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. [citations omitted]
>
> The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

The Office Action fails to meet this burden. Although the Office Action tries to describe how one skilled in the art would have been motivated to modify Shafer 722 to incorporate the teachings of Yonekubo and Suwa, these attempts fall short.

The Office Action states the motivation to combine the Shafer 722 reference with the immersion references (Yonekubo and Suwa) is that immersion liquids provide "better imaging performance," and suggesting the motivation to combine is "to use a immersion liquid like those taught in Yonekubo or Suwa with the objective of Shafer 722 to provide better imaging performance." Office Action, page 8. This is not a motivation to combine, but a conclusory, beneficial ***result*** gleaned from the teachings of Applicants and specifically Applicants' claims in an effort to deprecate Applicants' invention.

It is disingenuous and overly simplistic to say that an alternative design, wherein an immersion liquid is completely missing, but that includes an immersion liquid, would be desirable. Alternatives are always desirable. However, Shafer 722 specifically contemplates an objective design for use in the DUV/VUV realm *without any need, suggestion, or motivation to employ such an immersion liquid.* The immersion liquid, as shown by Appellants' disclosure, enables users to successfully inspect specimens using light from 190 nm through 1000 nm, where light energy passes through a back side of an element such as a mangin mirror arrangement, features not taught by Shafer 722. Shafer 722 does not contemplate the use of immersion liquids, even though immersion liquids were known and available.

Applicants also note that broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence" of a motivation to combine the references. *In re Zurko*, 59 USPQ2d 1693 (Fed. Cir. 2001); *McElmurry v. Arkansas Power & Light Co.*, 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993) ("Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact.")

As noted, the PTO has the burden of establishing a prima facie case of obviousness under 35 U.S.C. § 103. The PTO must show that some objective teaching in the prior art or knowledge generally held by one of ordinary skill would lead an individual to combine the relevant teachings of the references. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). Therefore, a combination of relevant teachings alone is insufficient grounds to establish obviousness, absent some teaching or suggestion to do so. *Id.* at 1075. In this case, the Office Action does not point to any teaching or suggestion in the cited references that would lead an artisan to come up with the claimed invention.

The Federal Circuit has held that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. *ACS Hospital System, Inc. v. Montefiore Hospital*, 732 F.2d 1572 (Fed. Cir. 1984). Without some showing in the prior art that suggests in some way a combination in order to arrive at the claimed invention, it is impermissible to use the Applicants' teaching to search references for the claimed elements and combine them as claimed. *In Re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991); *In Re Laskowski*, 871 F.2d 115, 117 (Fed. Cir. 1989); *see also*, *Ex Parte Lange*, 72 U.S.P.Q. 90, 91 (C.C.P.A. 1947) ("It seems to us that the Examiner is using appellant's disclosure for the suggestion of the combination since there is no suggestion in any of the patents for their combination in the manner claimed by Applicant."); *In re Leonor*, 158 U.S.P.Q. 20, 21 (C.C.P.A. 1968) (the issue is "whether teachings of prior art would, of themselves, and without benefit of applicant's disclosure, suggest [a process] which would make claimed invention obvious...") (emphasis in original). As noted, the Shafer 722 reference does not suggest using immersion liquids, such as the immersion liquids of Yonekubo or Suwa, to produce the unique designs claimed in Applicants' independent claims 1, 67, and 75, as amended.

Applicants submit that the Office Action uses hindsight in rejecting the claims herein. It is only through hindsight, after seeing Applicants' disclosure, that it would be considered possible to create the objectives and methods claimed by the Applicants. With regard to the use of hindsight, or the use of an Applicant's teaching to combine references, the courts have overwhelmingly condemned such combinations and have upheld the validity of patents or claims of patents in which such hindsight was employed to combine the references. *W.L. Gore Associates, Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983), (condemning the "insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher"); *In re Fine*, 837 F.2d at 1051 ("One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.") Appellants respectfully submit that combination of aspects of the Shafer 722 reference with the Yonekubo or Suwa references is merely a hindsight reconstruction of the invention using Applicants' disclosure and attempting to use Applicants' claims as a guide. Such hindsight reconstruction of the claimed system is inappropriate and thus rejection of the independent claims for this reason is improper.

The argument is sometimes made, citing *In re Sernaker*, 702 F.2d 989 (Fed. Cir. 1983) and *In re Nilssen*, 851 F.2d 1401 (Fed. Cir. 1988), that no express suggestion in the references for the combination of references is necessary. However, the issue is whether the references as a whole suggest the particular combination being used to reject the claims on obviousness grounds. When the Examiner must resort to selecting elements of various teachings in order to form the claimed invention, he or she must establish first that there is a suggestion or motivation in the prior art to make the particular selection made by applicant. *In re Gorman*, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). The Examiner has not established any legitimate suggestion or motivation to make the cited combination – she has only asserted that it would be desirable to employ some type of "immersion liquid" in an objective design because it might provide better imaging performance.

Applicants therefore submit that there is no motivation to combine the teachings of Shafer 722 with Yonekubo or Suwa present in the references themselves, and it is only through the use of impermissible hindsight that one could construct the invention as claimed. Thus claims 1, 67, and 75 are not obvious in view of the cited references.

Applicants respectfully submit that combining the immersion liquid of Yonekubo or Suwa with the Shafer 722 design is merely a hindsight reconstruction of the invention using Applicants' disclosure and claims as a guide. Such hindsight reconstruction of the claimed system is inappropriate and thus rejection of independent claims 1 and 67 in this manner is improper.

Shafer '518

The Office Action further rejected claims 1-3, 13, 14, 64, and 67-69 under 35 U.S.C. §103 based on U.S. Patent 5,717,518 ("Shafer 518") in view of Yonekubo or Suwa.

Shafer '518 is a broad spectrum ultraviolet catadioptric imaging system that again does not use an immersion substance. With respect to the independent claims as amended, Applicants note that performance is explained at Col. 6, line 57 et seq. of Shafer '518, including the statement that "[t]he resulting designs have a numerical aperture of about 0.9 *and a field size of about 0.5 mm diameter*." (emphasis added) Claim 67 as amended and new claim 75 recite a field size of greater than or equal to .10 millimeters. Neither Yonekubo nor Suwa show such a design. Thus claims 67 and 75 are not anticipated by the references cited, as they include limitations (NA of 0.9 and field size of 1.0 mm) not shown in any of the references, either alone or in combination.

Further, with respect to the field lenses and the relationship to the mangin mirror in Shafer '518, the two field lenses in Shafer '518 are generally positioned within the lens 39, which differs from the embodiment of FIG. 7 wherein the field lenses 710 and 711 are separate from and behind the mangin mirror arrangement 712. Thus referring to amended claim 1, the limitations: "a plurality of field lenses oriented to *receive focused light energy from said focusing lens group and provide intermediate light energy*;" and "a Mangin mirror arrangement *positioned to receive the intermediate light energy from the plurality of field lenses through a back side of the Mangin mirror arrangement* and form controlled light energy transmitted from a front side of the Mangin mirror arrangement" are not met. If the field lens arrangement of Shafer '518 is considered to "produce intermediate light energy," then the lens 39 of Shafer '518 is not "positioned to receive the intermediate light energy from the plurality of field lenses through a

back side of the Mangin mirror arrangement." The back side of the lens 39, such as that shown with respect to concave reflective surface coating 41 does not receive "intermediate light energy," i.e. energy transmitted from the field lenses illustrated. Thus the arrangement claimed differs from the '518 design. Again, neither Yonekubo nor Suwa show such a design. Thus claims 1 is not anticipated by the references cited, as it includes limitations (plurality of field lens limitations and Mangin mirror arrangement limitations) not shown in any of the references, either alone or in combination.

Additionally, similar to the arguments recited above, there is no motivation to combine the references in the manner suggested. Like Shafer 722, Shafer '518 is completely silent on use of an immersion liquid. Neither Yonekubo nor Suwa disclose nor suggest the unique properties associated with the present design. Yonekubo and Suwa show immersion liquids used in microscopes, but do not indicate use with light energy having a wavelength in the range of approximately 190 to 1000 nanometers, use focusing lenses and field lenses as claimed, or disclose or suggest at least one Mangin mirror arrangement receiving light energy through a back side thereof. Again, it is as if an immersion liquid was found in these references and assumed to be insertable into the Shafer '518 device. In reality, one could not simply place an immersion liquid within the Shafer '518 design and obtain an objective design having the beneficial aspects presently claimed or operating with any level of adequate performance. In other words, the resultant device would be a poor image and inadequate inspection in the environment claimed. Thus it is difficult, if not impossible, to argue that one would be motivated to combine the design of Shafer '518 with the immersion liquids of Yonekubo or Suwa based on the disclosure of the references themselves.

There is simply no suggestion in Shafer '518 to employ an immersion liquid or substance or a mangin mirror arrangement where light energy passes through a back side thereof, and no motivation in Yonekubo or Suwa to use an immersion liquid or substance in a complex lensing design comprising, for example, field lenses, focusing lenses, and a mangin mirror arrangement as currently claimed. Simply put, these references are materially diverse and each reference does not suggest employing the features disclosed in the other references in any manner whatsoever.

The Office Action states the motivation to combine the Shafer '518 reference with the immersion references (Yonekubo and Suwa) is that immersion liquids provide "better imaging performance," and suggesting the motivation to combine is "to use a immersion liquid like those taught in Yonekubo or Suwa with the objective of Shafer '518 to provide better imaging performance." Office Action, page 9. This is not a motivation to combine, but a conclusory, beneficial ***result*** gleaned from the teachings of Applicants and specifically Applicants' claims in an effort to deprecate Applicants' invention. Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence" of a motivation to combine the references. *In re Zurko*, 59 USPQ2d 1693 (Fed. Cir. 2001); *McElmurry v. Arkansas Power & Light Co.*, 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993) ("Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact.")

The Office Action does not point to any teaching or suggestion in the cited references that would lead an artisan to come up with the claimed invention. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. As noted, the Shafer '518 reference does not suggest using immersion liquids, such as the immersion liquids of Yonekubo or Suwa, to produce the unique designs claimed in Applicants' independent claims 1, 67, and 75, as amended.

Applicants submit that the Office Action uses hindsight in rejecting the claims herein. It is only through hindsight, after seeing Applicants' disclosure, that it would be considered possible to create the objectives and methods claimed by the Applicants. Such hindsight reconstruction of the claimed system is inappropriate and thus rejection of independent claims 1 and 67 in this manner is improper.

For the foregoing reasons, Applicants thus respectfully submit that claims 1, 67, and new claim 75 are allowable over the references of record, and that all claims dependent from these allowable independent claims are allowable as they depend from an allowable base claim.

CONCLUSION

In view of the foregoing, it is respectfully submitted that all claims of the present application are in condition for allowance. Reexamination and reconsideration of all of the claims, as amended, are respectfully requested and allowance of all the claims at an early date is solicited.

Applicants believe that no fees are due in accordance with this Response beyond those included herewith. Should any fees be due, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Account 502026.

Respectfully submitted,

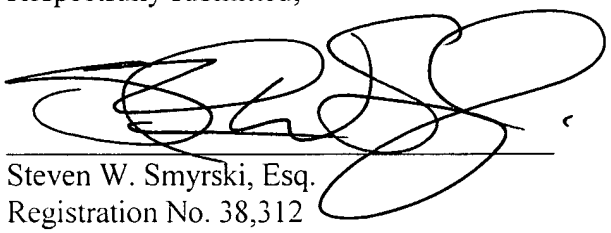

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Exhibit A